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REMARKS

In the Office Action, claims 3-9 are rejected under 35 U.S.C. §112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In the Office Action, claims 1, 20, and 23 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent Number 5,620,464 to Kroll.

In the Office Action, claims 2-6, 10-15, 19, 21, 22, 24, and 25 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent Number 5,620,464 to Kroll.

In the Office Action, claims 7-9 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. §112, second paragraph, and to include all of the limitations of the base claim and any intervening claims.

In the Office Action, claims 16-18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

In response thereto, claims 3-5 have been amended. Accordingly, claims 1-25 are now pending. Following is a discussion of the patentability of each of the pending claims.

Preliminary Matter

In response to the rejections of claims 1-6 under 35 U.S.C. §112, second paragraph, the following amendments have been made:

claim 3, lines 2-3, --the switching network periodically connects-- has been inserted between "wherein" and "the battery";

claim 4, lines 1-2, "converter" has been replaced with --switching network--; and

claim 5, lines 1-2, "converter" has been replaced with --switching network--.

Independent Claim 1

Claim 1 recites an implantable medical device comprising an implantable delivery device, a battery, a converter, and a controller. The converter is coupled to the battery and to the implantable delivery device wherein the converter comprises at least one bypass capacitor and a switching network. The at least one bypass capacitor is

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selectively connected to the battery via the switching network, and the converter further comprises at least one delivery capacitor that is coupled to the implantable delivery device. The controller induces the converter to change between a quiescent period and a charging cycle wherein the at least one bypass capacitor is connected to the battery during the charging cycle. The delivery capacitor is also charged during the charging cycle based on the charge in the at least one bypass converter. The controller further controls the converter to disconnect the at least one bypass capacitor from the battery after completion of the charging cycle to reduce undesired dissipation of the battery energy as a result of leakage currents during the quiescent period of the converter.

In accordance with the specification of the present application, the bypass capacitors (210) have a capacitance on the order of 20 to 50 microfarad. As is illustrated in Figure 3, the plurality of bypass capacitors are connected across the primary winding (212a) of a transformer (212) in series with a secondary switch element Q1, such that pulsed current drawn by the transformer does not result in too high a voltage ripple on the battery voltage. In other words, the bypass capacitors are high frequency filters, e.g., on the order of 50 to 250 kHz.

The Kroll et al. reference discloses an implantable cardioverter defibrillator device having a circuit to deliver multiple closely spaced defibrillation pulses to a heart. The circuit comprises a low power output primary defibrillator battery (70), a high power output intermediate power intensifying capacitor system (70), a switch for permitting the intermediate power intensifying capacitor system to rapidly charge a main energy delivery capacitor, and a main energy delivery capacitor (32).

The Kroll et al. reference does not disclose or suggest a circuit having a bypass capacitor. In the Kroll et al. reference, element 74 is a storage capacitor which provides stored energy to rapidly charge a main energy delivery capacitor. The storage capacity of element 74 is many orders of magnitude larger than the bypass capacitors. For example, element 74 has a capacitance rating of 1.5 farads (see column 6, line 10 of the Kroll et al. reference) while the range of capacitance for the bypass capacitors is 20 to 50 microfarads (see page 15, line 9 of the present application).

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Furthermore, the Kroll et al. reference does not disclose or suggest a controller that controls a converter to disconnect the at least one bypass capacitor from the battery after completion of the charging cycle to reduce undesired dissipation of battery energy as a result of leakage currents during the quiescent period of the converter. Figure 3 of the present application illustrates an exemplary embodiment having elements Q2, D1 and 242 to disconnect the bypass capacitor from the battery. Figure 5 of the Kroll et al. reference does not illustrate circuit components which enable disconnection of the capacitor (74) from the battery, and the specification does not describe the control system (30) providing such a feature.

Accordingly, it is respectfully submitted that claim 1 is in condition for allowance.

Dependent Claims 2-10

Claims 2-10 depend from claim 1 and are similarly patentable. Accordingly, it is respectfully submitted that these claims are in condition for allowance.

Independent Claim 11

For at least the same reasons discussed previously with regards to claim 1, it is respectfully submitted that claim 11 is in condition for allowance.

Dependent Claims 12-19

Claims 12-19 depend from claim 11 and are similarly patentable. Accordingly, it is respectfully submitted that these claims are in condition for allowance.

Independent Claim 20

For at least the same reason discussed previously with regards to claim 1, it is respectfully submitted that claim 20 is in condition for allowance.

Dependent Claims 21-25

Claims 21-25 depend from claim 20 and are similarly patentable. Accordingly, it is respectfully submitted that these claims are in condition for allowance.

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CONCLUSION

In light of the above claim amendments and remarks, it is respectfully submitted that the application is in condition for allowance, and an early notice of allowance is requested.

Respectfully submitted,

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Date

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